

TAKING STOCK

Related Cross-Curricular Areas

- Environment and Sustainability
- Career Development
- Information Technology
- Applied Focus in Curriculum

Tree rings teach students the importance of observing nature to understand local environments how discover how major natural events and human activity can affect our natural resources.

Objective:

- Students will discover: how to tell the age and life events of a tree; how to estimate tree height; and, how to take an environmental inventory of a specific piece of land.

Method:

- Students will examine “tree cookies”, use simple tools, analyze and research data using various sources including computers.

This activity is a chance for students to demonstrate the ability to work individually and co-operatively to solve problems using basic forest measurement tools. It will also give them a chance to use the data to describe forest areas.

The ability to observe and record information accurately is key. Students will demonstrate the ability to conduct research using print, non-print, and electronic sources.

Since our understanding of nature isn't based simply on observation but our experience with it over the long-term, students will learn about their own particular place, how it fits into the region and the history of human interactions with it. This will give them a chance to describe relationships and analyze patterns of change as they evaluate how major natural events and human activity can affect local and global environments and climate change.

Location: Classroom and outdoors, a nearby park?

Preparation:

Obtain a number of “tree cookies” – rounds sliced from different trees. You might ask a local forester for assistance or contact one of the resource groups provided in links. Provide student groups with wedges from these rounds telling them the name of the species and, if possible, the area the tree came from.

Annual rings tell how old a tree is. They can tell about the conditions and events that affected the tree's growth, such as soil type, climate, floods, disease, lake levels, forest fires, insect infestation and human influences such as logging or air pollution. The spacing of the annual rings also tells us about the quality of the wood.

Dendrochronologists are people who study annual rings to find this kind of information. Ask students to study a tree sample to try to recreate the life of a tree.

As a group, students could write a "tree journal." They can use the following questions to recreate the life of the tree as best they can.

- What is the tree species?
- How old is the tree? Count the annual rings and find out.
- What was the year of its birth?
- What events has it lived through? If any students are studying local history or geography, have them research the events the tree lived through.

Have students compare their tree sample with ones from other trees and describe the differences. Which had healthy lives and which suffered? How do you know?

Students should look at the ring patterns and their thicknesses. Then describe how the tree grew during its lifetime. Are the rings evenly spaced? Were there periods of rapid or hardly any growth? Are there signs of disease, fire? Do they see any knots? When did they form? Explain how old the tree was in describing events in its life.

Students might write their findings in a computer journal format. Here is a sample beginning:

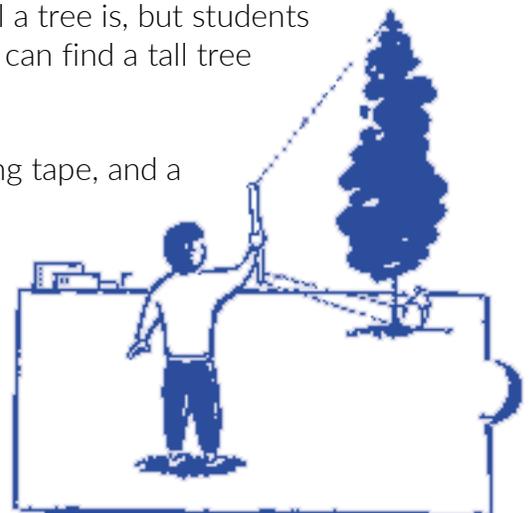
"This tree is a (name of species). It lived from (date) to (date). This tree has seen dramatic disturbances in its lifetime, including ..."

Foresters use special measuring devices to determine how tall a tree is, but students can estimate the height using the following method: Students can find a tall tree near the school and a helpful classmate.

They will need: a pencil, a notebook, a 50 cm stick, a measuring tape, and a length of brightly coloured tape.

INSTRUCTIONS:

Mark the 50 cm stick at a point 5 cm from one end. Holding the stick at arm's length (with the 5 cm mark toward the ground), walk away from the tree until the top and bottom of the stick are in line with the top and bottom of the tree. (Students should be on level ground.) In pairs, one student



can direct a classmate to mark, with the coloured tape, the spot on the tree where the 5 cm mark lines up. (See illustration below.)

The other student can measure the distance from the ground to the tape marker on the tree and multiply the distance by 10. Voilà! Here is an estimated tree height. Can students explain why this simple system works?

Other tree height measurement ideas here with photos:

<https://learningwithoutdoors.com/learningactivities/tree-measure>

<http://www.csgnetwork.com/treeheightcalc.html>

<https://www.wikihow.com/Measure-the-Height-of-a-Tree>

<https://bigtrees.forestry.ubc.ca/measuring-trees/height-measurements/>

<https://www.youtube.com/watch?v=-3vrHDEzbcS>

<https://www.youtube.com/watch?v=M7o8EbJKf4U>

This activity is a simplified version of how foresters gather a forest inventory.

- Organize into groups of four or five students and find a wooded area near the school or home. This is the plot in which students will conduct a forest inventory.
- For equipment, students will need: a tape measure (15 to 30 metres long), a notebook, a pencil, a 50 cm stick, some brightly coloured tape, the tree identification key provided in [The Tree Book](#)
- Using the tape measure, students must plot out an area 25 metres square containing five to ten trees. Mark this area with coloured tape.
- They should describe the location and size of the plot in their notebook. Draw a map of the plot showing the topography, location of streams, ponds, human activity and so on.
- Using [The Tree Book](#), list each of the trees by species. Make a chart organized by species showing the height and diameter at breast height (1.3 metres above ground). Note the quality and health of each tree.
- Prepare an inventory of other resources in the plot (other plant or animal life, human uses). Note the factors that would have to be considered if this plot were to be harvested.

- Using the information gathered, students are to prepare a report describing the resources in their inventory area. In small groups or individually they can research the history of this area and note any changes and similarities in the environment over time. Consider human impact and any natural changes (i.e. erosion, flooding, fire, etc.). Try local archives, fire department, Internet news databases, city parks staff, etc.
- If students have access to a computer with a data management program, or GIS, they may use it to organize their information and to compile the report.

Besides dendrochronologists and foresters, ask students to consider what other jobs might be associated with preparing a resource inventory.

Suggested Assessment Strategies:

- Assess accuracy of answers to tree diary questions
- Ability to estimate tree height using simple tools and procedure
- Ability to gather information about a specific environment to create a topographic map and environmental inventory report
- Use of computer to organize data and compile report
- Ability to cooperate with others to share research procedures and information

Related Resources/Links

[Environment and Climate Change Canada](#)

[Fisheries & Oceans Canada](#)

[BC Ministry of Forests](#)

[Association of BC Forest Professionals](#)

[Canadian Forest Service](#)

[Natural Resources Canada](#)

[BC Council of Forest Industries](#)

[Green Teacher](#)

[Canadian Parks and Wilderness Society \(CPAWS\)](#)